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AD 401 461

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63_3_2

TECHNICAL
MEMORANDUM

(TM Series)

<u>ASTIA AVAILABILITY NOTICE</u>

Qualified requesters may obtain
copies of this report from ASTIA.

SCF Computer Program Systems Manual	SYSTEM
General Purpose Satellite Programs	
Correct Apparent Elevation for Refraction (RC)	DEVELOPMENT
	CORPORATION
by	
Nancy Speer	2500 COLORADO AVE.
28 January 1963	SANTA MONICA
Approved	CALIFORNIA
J. D. Marioni	

SDC

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SUBROUTINE IDENTIFICATION

    A. Title: Correct Apparent Elevation for Refraction (RC) --
    Ident. F99, Mod. NS.

    B, Programmed: J. C. Lenhoff, Lockheed Missile and Space Division

    C. Revised and Documented: 9 November 1962, Nancy Speer, System
    Development Corporation.

PURPOSE

    RC corrects for refraction any number of apparent elevations which
    are within the range 0 to 2π.

USAGE

    A. Calling Sequence:

            L   RTJ   RC

            L+1   ZRO   EA

                     ZRO   N

            L+2   NORMAL RETURN

    where: EA = the location of the first elevation to be corrected.

            N = the number of elevations to be corrected.

    B, Inputs:

    The input elevations must be expressed as floating-point radians
    within the range 0 to 2π.

    C, Results:

    Each corrected elevation, as a radian value in floating-point
    format, is placed in the location of the input elevation. The
    correction factor is stored in the first cell of COMMON.

RESTRICTIONS

    A. Accuracy

    The results of RC fall well within the requirement of accuracy to
    the fourth decimal place. A more definite statement of accuracy
    can not be made because accuracy varies greatly depending on the
    magnitude of the input and its proximity to any pair of entries in
    the two tables used for interpolation.

B. Input Limits

Inputs must be within the range 0 to 2π. Inputs outside these limits will not be reduced properly and will cause an error return from INDIV which, in turn, causes a jump to SUBERR and consequent halt.

C. Environment

RC uses the subroutines INDIV and SUBERR, and the Reference Pool. Index registers 1 and 2 are saved, used, and restored.

TIMING

Maximum $243.6 \times N + 101.4$ microseconds plus time for INDIV

Minimum $198.0 \times N + 101.4$ microseconds plus time for INDIV

            where N = number of elevations

STORAGE REQUIREMENTS

Storage Allocation

Program 36_{10} cells

Constants 122_{10} cells

Temporary Storage   1   cell
                          ————
                          159_{10} cells

REFERENCES

A. LMSC-447578, Page 55.05.13, Systems Manual Subroutine Description of RC.

B. TM-(L)-715/025/00, Utility Program Descriptions, Milestone XI, Interpolate by Divided Differences (INDIV). (AFCPL Catalog Number 75024)

C. LMSD-447578, Page 50.06.01, Systems Manual Subroutine Description of SUBERR.

D. TM-714/032/00, General Purpose Satellite Computer Program Descriptions, Milestone XI, Correct Apparent Elevation for Refraction (RC), 9 November 1962. (AFCPL Catalog Number 75599)

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System Development Corporation,
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SCF COMPUTER PROGRAM SYSTEMS MANUAL
GENERAL PURPOSE SATELLITE PROGRAMS
CORRECT APPARENT ELEVATION FOR
REFRACTION (RC).
Scientific rept., TM(L)-721/018/00,
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Systems Division, AFSC)

Unclassified report

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